

WHAT IS CLAIMED IS:

1. A process of milling corn comprising:

mixing water and corn kernels to provide a tempering mixture;

holding the tempering mixture for a time and temperature which are effective for lifting hull off from the endosperm of the corn kernels, but which are not effective for moisture to substantially penetrate into the endosperm of the corn kernels;

abrasively removing germ and bran from the moistened tempered corn of the corn kernels by rubbing the moistened tempered corn against at least one screen to provide not more than 35 wt% thrustock, not more than 10 wt% bran, and at least 65 wt% tail stock, the thrustock having at least 8 wt% fat and the tail stock having less than 1.75 wt% fat.

2. The process of claim 1 wherein the tail stock has a flaking grit stream and a tail corn stream, the tail corn stream having a particle size of at least about 5,664 μm .

3. The process of claim 2 further comprising sizing the tail corn stream to a flaking grit size which is smaller than about 5,664 μm and larger than about 3,987 μm wherein the process yields at least about 25 wt% flaking grits based upon the weight of corn kernels after cleaning and prior to milling.

4. The process of claim 1 further comprising a step of separating large corn kernels from small corn kernels into a small corn component and a large corn component prior to milling.
5. The process of claim 4 wherein the steps of milling, holding, abrasively removing, and sizing are performed on the large corn component.
6. The process of claim 1 wherein the steps of milling, holding, abrasively removing, and sizing are performed on whole corn kernels.
7. The process of claim 1 which yields at least 30 wt% flaking grits based upon the weight of corn kernels prior to milling.
8. The process of claim 7 which yields at least 35 wt% flaking grits based upon the weight of corn kernels prior to milling.
9. The process of claim 8 which yields at least 38 wt% flaking grits based upon the weight of corn kernels prior to milling.

10. The process of claim 1 wherein the at least one screen has rectangular holes having a size of 1 mm to 3 mm by 20 mm to 25 mm.

11. The process of claim 3 wherein the tail corn stream is sized by grating which moves the tail corn stream with a moving surface over perforations and cutting edges to size the tail corn stream, wherein the moving surface and the size of the perforations are effective to provide flaking grits.

12. The process of claim 11 wherein the perforations over which the tail corn component is moved have a size of from 4 mm to 7 mm.

13. The process of claim 3 wherein the sizing of the tail corn stream is an abrasive sizing by pushing the corn particles against a slotted screen which produces corn particles of a flaking grit size and a residual corn particle stream which is larger than flaking grit size, the process further comprising sizing larger particles in the residual stream by grating.

14. The process of claim 1 wherein corn is abrasively sized by rubbing the moistened tempered corn against at least one screen.

15. The process of claim 1 wherein at least 90 wt% of the corn kernels have a hardness of at least 58 wt% under a Quaker hardness test.

16. The process of claim 1 wherein the holding step comprises tempering the corn kernels with moisture having a temperature of 80°C to 100°C for a time of 90 seconds to 3 minutes.

17. A process of milling corn comprising:

separating whole corn kernels, at least about 90 wt% of which have a hardness of at least about 58 wt% under a Quaker hardness test, into a small corn component and a large corn component;

tempering the large corn component with moisture having a temperature of about 80°C to 100°C for about 90 seconds to 3 minutes for lifting hull off from the endosperm of the large corn component without moisture substantially penetrating into the endosperm of the large corn component;

abrasively removing germ and bran from the moistened tempered corn by rubbing the moistened tempered corn of the large corn component against at least one screen to provide not more than 35 weight percent thrustock and at least 65 weight percent tail stock, the thrustock having at least 8 wt% fat and not more than 10 wt% bran, and the tail stock having less than 1.75

wt% fat, the tail stock having a flaking grit stream and a tail corn stream, the tail corn stream of the large corn component having a particle size of at least about 5,664 μm .

18. The process of claim 17 further comprising sizing the tail corn stream of the large corn component by rubbing the moistened tempered corn against at least one screen to provide a second flaking grit stream and a residual large particle stream.

19. The process of claim 18 further comprising separating the second flaking grit stream from the residual large particle stream; and

further sizing the large particle stream from the large corn component by grating the large particle stream by moving the large particle stream with a moving surface over perforations and cutting edges to size the large particle stream, the process effective for providing flaking grits in yield of at least about 25 wt% based on the weight of the large corn kernels prior to tempering.

20. The process of claim 19 further comprising milling the small corn component by mixing water and the small corn component to provide a small corn component tempering mixture;

holding the small corn tempering mixture for a time and temperature effective for lifting hull off from the endosperm of the small corn kernels, but a time and temperature which is not

effective for moisture to substantially penetrate into the endosperm of the small corn kernels of the small corn component; and

abrasively removing germ and bran from the moistened tempered corn of the small corn component by rubbing the moistened tempered corn against at least one screen to provide a small corn component thrustock and a small corn component tail stock.

21. The process of claim 18 wherein the screen has rectangular holes having a size of about 1 mm to 3 mm by 20 mm to 25 mm.

22. The process of claim 19 wherein perforations have a size of from about 4 mm to 7 mm.

23. The process of claims 17 further comprising pre-selecting corn kernels such that at least 90 wt% of the corn kernel have a hardness of 58 to 65 wt% under a Quaker hardness test.

24. A process of milling corn comprising:

separating whole corn kernels into a small corn component and a large corn component;

milling the large corn component by mixing water and the large corn component to provide a tempering mixture;

holding the tempering mixture for a time and temperature effective for lifting hull off from the endosperm of the corn kernels, but a time and temperature which is not effective for moisture to substantially penetrate into the endosperm of the corn kernels of the large corn component;

abrasively removing germ and bran from the moistened tempered corn of the large corn component by rubbing the moistened tempered corn against at least one screen to provide not more than 35 weight percent thrustock and at least 65 weight percent tail stock, the tail stock having a flaking grit stream and a tail corn stream, the tail corn stream having a particle size of at least 3½ mesh; and

sizing the tail corn stream of the large corn component to a flaking grit size which is smaller than 3½-mesh and larger than 5-mesh such that the process yields at least 38 weight percent flaking grits, based upon the weight of large corn kernels going into the process;

milling the small corn component by mixing water and the small corn component to provide a small corn component tempering mixture;

holding the small corn tempering mixture for a time and temperature effective for lifting hull off from the endosperm of the small corn kernels, but a time and temperature which is not effective for moisture to substantially penetrate into the endosperm of the small corn kernels of the small corn component; and

abrasively removing germ and bran from the moistened tempered corn of the small corn component by rubbing the moistened tempered corn against at least one screen to provide a small corn component thrustock and a small corn component tail stock.

25. A process of milling corn comprising:

separating whole corn kernels into a small corn component and a large corn component;

milling the large corn component by mixing water and the large corn component to provide a tempering mixture;

holding the tempering mixture for a time and temperature effective for lifting hull off from the endosperm of the corn kernels, but a time and temperature which is not effective for moisture to substantially penetrate into the endosperm of the corn kernels of the large corn component;

abrasively removing germ and bran from the moistened tempered corn of the large corn component by rubbing the moistened tempered corn against at least one screen to provide not more than 35 weight percent thrustock and at least 65 weight percent tail stock, the tail stock having a flaking grit stream and a tail corn stream, the tail corn stream having a particle size of at least 3½ mesh; and

sizing the tail corn stream of the large corn component to a flaking grit size which is smaller than 3½-mesh and larger than 5-mesh such that the process yields at least 38 weight percent flaking grits, based upon the weight of large corn kernels going into the process.